

tables, in common use, are defective and that so far, no mathematical formula has been devised which is truly accurate and which is applicable to all persons. The individual variation can not be calculated by rule. But after making physical examination of several thousand children in this country and abroad and comparing their physical status with their nutritional index, the "pelidisi," the writer is impressed with the practicability of the scheme. There is a strikingly constant relationship between the "pelidisi" and the physical findings, which latter Pirquet symbolizes with the phrase "sacratama." For all practical purposes, the "pelidisi" affords an effectual working rule.

The "sacratama" is very acceptable both in clinic and in office, but particularly is it useful when examining large numbers of children and making a record of the findings. At first blush it may appear confusing, but in actual operation it is simplicity itself. As to the unit of food measurement, the "nem," the writer believes it is much simpler and more comprehensible to the uninitiated, and that it is just as accurate as a unit of measurement as is the calorie. However, the fact that the calorie is already fairly well established in American usage may make the substitution of the "nem" difficult and undesirable.

It appears that the Pirquet system can be applied, with appropriate modifications, to American conditions. The exigencies of war no longer exist and the attitude of the people would not permit the strict disciplinary measures, applied abroad, which are inherent in this method. But it should not be forgotten that the outstanding feature of the system is the fact that children are fed a well-balanced, sufficient, midday ration, and that their weight curves bear eloquent testimony to its effectiveness. In America there is an abundance of food, and facilities for the feeding of school children in a comprehensive way could be developed readily. The dairy lunch rooms which serve food prepared at a central kitchen may give us an illustration how the thing may be done. Materials could be bought at wholesale prices, the recipes and menus could be provided by dieticians on physician's prescriptions, and the food could be cooked in central kitchens. From these kitchens it could be delivered hot, in double-walled containers, to the schools and there dispensed by volunteers or even by paid assistants. The cost of a meal so prepared would be less than that at which the mother could provide the food herself. It is to be hoped that those interested in school feeding programs may be able to do as much for our own children in this respect as has been done for the children of central Europe.

SUMMARY

American school children show a startling percentage of malnutrition. The well-balanced midday meal, properly administered, has been proved to be helpful. Our present haphazard methods of feeding school children are not entirely satisfactory in producing a general improvement. There should be little difficulty in applying a modified Pirquet system.

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THE USE OF THE PUPILLOSCOPE IN NEUROLOGY *

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The Argyll-Robertson pupil has for many years been considered almost pathognomonic for neurosyphilis. True, of late years some questions have been raised as to the possibility of other conditions, viz., trauma and encephalitis, simulating that phenomenon. Its usefulness as a sign was considerably impaired by the lack of a standard method of eliciting the sign. It is well-known that the results of examinations by different clinicians of the same case will contain such misleading statements as "sluggish," "doubtful," "normal," "present" or "questionable." It also was impossible to register the degree of pupillary involvement so that it could be compared at some future time with a repeated reading.

In the Differential Pupilloscope of Von Hess all sources of error have been eliminated and a very exact quantitative method inaugurated. The aim of the instrument is to determine the sensibility of the pupil to successive differences of light. The patient's eye is observed through a telescope of eight magnifications. From a constant source of illumination a beam of light is cast upon the eye. This beam of light is made to traverse a frame which consists of two compartments. The upper compartment contains a gray glass of known permeability to light. The lower contains two gray prisms which are calibrated and can be superimposed, one on the other, to any desired extent, by means of a micrometer screw. The amount of light passing through the lower compartment is varied by changing the position of the prism. The frame is then swung up and down so that the beam of light passes successively through the upper and the lower compartments. When the permeability of the compartments is equal we are illuminating the eye with a constant beam of light. By changing the permeability of the lower compartment it is in our power to illuminate the eye with any desired difference of light. We now determine the least difference of light which just suffices to elicit reaction of the pupil and this difference of light is a numerical index of the sensibility of the pupil and, therefore, of the pupillary reflex arc. The prisms are most permeable to light at their apices and least at their bases so that the permeability of the systems of prisms varies according to the positions of the superimposed portions. The position of the prisms and the amount of light passing through are shown on the micrometer scale and we can thus measure accurately the amount of light necessary to secure reactivity of the pupil. The smallest difference of light intensities between which the normal pupil can distinguish is as 95 to 100. The value is constant, is irrespective of the age of the individual and is independent of the state of adaptation. The lowest limit of the physiological index is 0.88. Diminution of the index to 0.86 is definitely pathological, but a pupillary lesion of

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such small degree is not detectable by any other methods.

The pupilloscope findings were recorded in 108 cases. The material was taken from the Neurological Clinic of Stanford University Medical School and was, therefore, richer in positive findings than would be expected in the general run of syphilitic patients. Nearly every case examined had some subjective neurological symptom which raised a question that a central nervous lesion might be a possibility.

We divided the material into four divisions: Cases showing a positive blood Wassermann without any spinal fluid involvement, active cerebrospinal syphilis, neuro-syphilis without meningeal reaction and cases without meningeal reaction which, because of some symptoms, might conceivably have had a syphilitic lesion at some previous time.

1. Of the first type of cases, showing a positive blood Wassermann without any spinal fluid involvement, we had twenty-five of whom we could not be certain from the neurological examination that any central nervous system involvement had occurred. Ten, or 38 per cent, showed a positive Argyll-Robertson pupil. Five of these, or 50 per cent of the number of positive cases, did not show any clinical symptoms suggesting a central nervous system involvement. These findings raised the question: How accurate an indicator is the spinal fluid of the activity of neuro-syphilis? It would seem possible that an involvement of the central nervous system had occurred at some previous time in their history, perhaps at the time of the secondary lesions, but later, as the result of natural immunity, became arrested or cured. On the other hand, it is uncertain that one negative lumbar puncture may not give us an absolute guarantee of the absence of neuro-syphilis involvement, the negative result being only a temporary remission in a continuous process. At any rate, it may well have been that the subjective complaints of these patients, which could not be verified by other neurological findings, or even by the ordinary methods of testing for Argyll-Robertson pupils, may be due to a burnt-out or arrested neuro-syphilis.

2. In active neuro-syphilis, the Argyll-Robertson pupil occurred in twenty-three cases out of thirty, or in 77 per cent of the cases. This frequency was very much what we would expect it to be, although it is always well to bear in mind that in this group we have patients who have definite evidence of syphilitic involvement in their spinal fluid, have the subjective symptoms and some of the objective signs, and yet do not have the Argyll-Robertson pupil elicited either by our ordinary clinical methods or by the pupilloscope.

3. The third type of case studied was neuro-syphilis without meningeal reaction. In this group we had a surprisingly large percentage of positive Argyll-Robertson pupils; twenty out of twenty-five cases, or 80 per cent.

The group consisted of nine cases which had apparently been arrested spontaneously and sixteen

in which an arrest had been secured by means of therapy. In both types the disease had progressed far enough so that the percentage of Argyll-Robertson pupils was high. It is interesting to note that those arrested by natural means had progressed further than those arrested by means of therapy.

The use of the pupilloscope in this group was of special interest in that the cerebro-spinal fluid was normal and would not give us our most decisive diagnostic evidence.

4. The fourth group consisted of cases with negative blood and spinal fluid, some diagnosed as encephalitis and some of doubtful diagnosis. Every case in this group had some symptom or sign which tended to bring up the question of neuro-syphilis at least as a point of differential diagnosis. Of this number, seven cases of Argyll-Robertson pupils occurred, or nearly 26 per cent. This finding was of special importance in this group as without it a diagnosis could not have been made.

Of almost equal importance was the percentages that we find negative, as these negative findings tended to head the diagnoses in other direction. There were nine cases of encephalitis, most of whom had a typical history and physical findings, not one of whom showed an Argyll-Robertson pupil. Seven (77 per cent) showed an ophthalmoplegia-interna, two showed no eye findings whatever. These findings were interesting in that some observers (particularly Waardenburg) would consider an Argyll-Robertson pupil as occurring in encephalitis. As a diagnostic point, an Argyll-Robertson pupil would, in our experience, argue for neuro-syphilis and never for an encephalitis.

In comparing the delicacy of the pupilloscope findings with the ordinary clinical tests, we may say that of the whole number of cases, thirty-nine, or 63 per cent, were diagnosed by the ordinary methods as Argyll-Robertson pupils. The pupilloscope enabled us to diagnose 34 per cent in addition. It also definitely disproved an Argyll-Robertson pupil in 66 per cent of doubtful cases.

CONCLUSIONS

From the above discussion the following conclusions may be drawn:

1. The pupilloscope will in no way replace the usual diagnostic methods in the determination of the ordinary Argyll-Robertson pupil.

2. Its maximum usefulness will be found in doubtful central nervous system involvement, especially when the pupillary reaction is ordinarily described as doubtful or sluggish. It may here be the means of making a diagnosis of neuro-syphilis without recourse to lumbar puncture.

3. In no case has an Argyll-Robertson pupil been found in encephalitis by the pupilloscope. Either the pupil was normal or we found an ophthalmoplegia-interna.

4. In a research way it may be the means of clearing up such problems as the comparative reliability of a positive spinal fluid or beginning Argyll-Robertson, as to prognosis, or the desirability of therapy directed toward neuro-syphilis.

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